The Study of Plants in Mesopotamian Scholarship

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/ Abstract

Although plants are ubiquitous in our records from antiquity, our understanding of them is often curbed by uncertainty. This is especially true in the case of Assyro-Babylonian plants, and consequently, of all the fields of study that heavily depend on a correct interpretation of their names. This paper presents a quick overview of the study on plants in ancient Mesopotamia. Providing some brief examples from the history of the discipline, it explains how the study of ancient Mesopotamian plants has been approached from the early days of Assyriology until today. It also introduces the principal sources of information that have been available to scholars, while examining the major problems involved in the work, explaining their implications, and offering some new questions, or potential directions for future study.

Sebbene le piante siano onnipresenti nella documentazione antica, la nostra comprensione di esse è spesso limitata. Ciò è particolarmente vero nel caso delle piante assiro-babilonesi e, di conseguenza, di tutti i campi di studio che dipendono strettamente da una corretta interpretazione dei loro nomi. Questo articolo offre una rapida panoramica dello studio delle piante nell'antica Mesopotamia: fornendo alcuni brevi esempi, tratti dalla storia della disciplina, spiega come sia stato affrontato sin dai primordi dell'assiriologia, ed introduce le principali fonti di informazione disponibili agli studiosi. Al contempo esamina alcuni dei maggiori problemi legati a questo tema di ricerca, spiegandone le implicazioni e indicando potenziali direzioni per studi futuri.

/ Keywords

Plants in Mesopotamia; Ancient plants; Ancient botany; Cuneiform plants.

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1. Introduction

Plants touch on pretty much every aspect of life, and their study necessarily reflects many different kinds of expertise. Rather than a comprehensive examination of the subject, this paper is therefore intended as an occasion to begin exploring how the study of ancient Mesopotamian plants is developing, and to do it by means of tailored examples. It introduces the main categories of evidence available from Mesopotamia, highlighting the main problems inherent their study, and how scholars went about trying to solve them. Some of the methods employed today to work with the material are thus described, while reflecting upon potential ways to (partially) overcome the complications posed by the nature of the evidence.

2. Earliest recording and classification of plants

Over several millennia of history, many different peoples lived in the lands of Mesopotamia, speaking several different languages, and especially leaving behind an incredible quantity of archaeological remains, and of cuneiform tablets – roughly half a million of them – both of which carry large amounts of information in regards to plants. While a full system of writing was in place already in the mid-fourth millennium, most of the texts that inform our interest on plants in Mesopotamia are dated from the last two millennia BCE. In these textual sources, mentions of plants are ubiquitous. Even before their name was spelled out in ways that reflected the sounds of the language, some of these plants occurred in pictographic shape in the earliest administrative documents ever recorded, dated to the early fourth millennium BCE.

Fig. 1. MS 3147/2 (P252157). Administrative tablet dated to the Uruk V period (ca. 3500–3350 BC), showing an early sign ŠE (for barley, or crops). The Cuneiform Digital Library Initiative (CDLI). December 15, 2004. https://cdli.ucla.edu/P252157. Tablet kept in the Schøyen Collection, Oslo, Norway. Image © Martin Schøyen and the Schøyen Collection.

Over time the textual sources became more specific, and scribes began to assign classifiers to general names of plants (Ú: Fig. 2), trees (GIŠ), aromatic plants (ŠIM), garden plants (SAR), crops (ŠE: Fig. 1), and reeds (GI), so that when people picked up a tablet they knew immediately whether the word they were reading referred to the name of a generic plant (Ú), or else.

Now classified in such manner, various

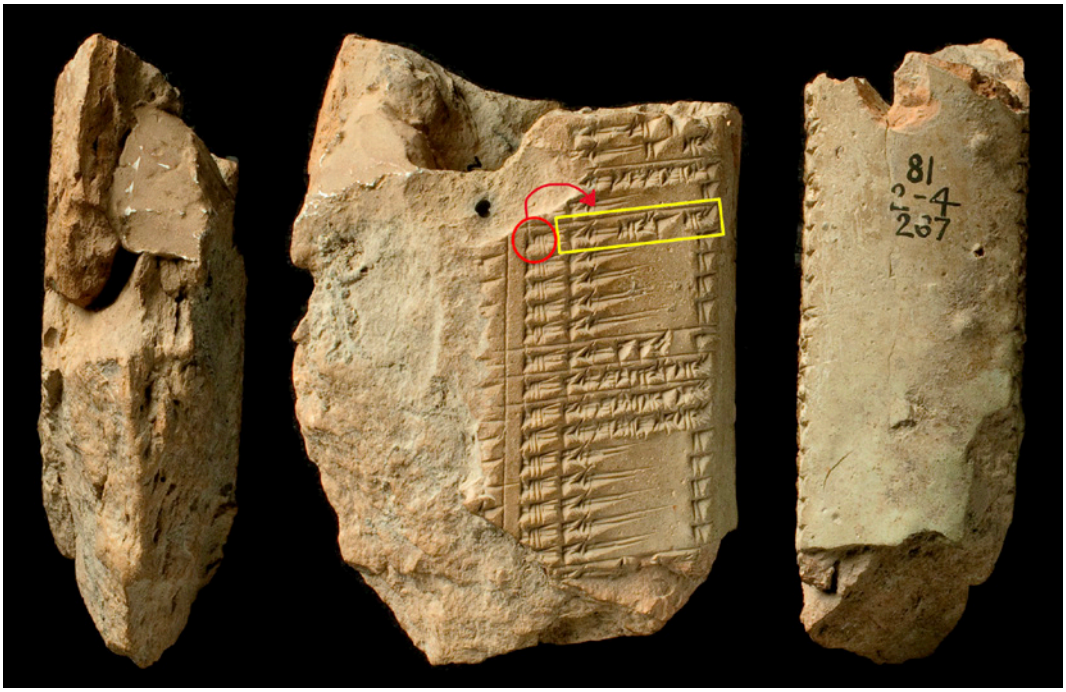

Fig. 2. Example of a lexical list displaying names of plants introduced by the classifier Ú (K 20572). © The Trustees of the British Museum. The original image was slightly modified by the Author to highlight the elements described in the discussion.

categories of objects, including plants, were then collected in long lexical lists, as part of an effort to learn and teach about the world. Since they were most often organized in the form of bilingual dictionaries or as lists of equivalent substances, such lists are extremely useful to modern scholars who want to gain a sense of the extent of the material. For example, in the pharmacological list known as Uruanna, which was compiled in the 7th c. BCE from sources going back several centuries and served as a dictionary of medicinal plants, one may find approximately 1300 different names of drugs of vegetable origin. This surprisingly high number is partially to be explained by the fact that the list included synonyms and equivalent names in foreign languages. And yet, even excluding similar and/or equivalent substances, the remaining names reveal a pharmacopeia of hundreds of different plants, in the range of at least 400.[1]

[1] Barbara Böck, "Sourcing, Organizing, and Administering Medicinal Ingredients", in *The Oxford Handbook of Cuneiform Culture*, ed. Karen Radner and Eleanor Robson (Oxford: Oxford University Press, 2011), 690–705. In regard to this last point, I would note that a pharmacopoeia in the range of a few hundred plants seems roughly equivalent to the numbers we derive from classical authors, i.e. from Theophrastus in the classical period, and especially, later on, from Dioscorides' *De Materia Medica* (1st c. CE), which counts "well over 600 items". See Lily Y. Beck (ed.), *Pedanius Dioscorides of Anazarbus: De Materia Medica* (Hildesheim: Olms, 2011), XVIII.

3. Types of sources

Such names occur in various areas of Mesopotamian scholarship, in specialist lists, as just mentioned, but also in works that describe their physical appearance, as in the earliest herbal we have from history, known by its incipit "*šammu šikinšu*".[2] As expected, they play a major role in the thousands of recipes from the medical corpus (an estimate has counted some 5000 of such recipes, thus far),[3] and in handbooks that point to their medicinal properties, but their use was recorded in non-medical works as well. A smaller group of aromatic and oil-producing plants, for instance, is mentioned in texts describing procedures for the making of perfumes,[4] while vegetables, spices and ordinary plants also figured in cookbooks, which preserved several elaborate recipes for the preparation of gastronomic dishes.[5]

All these sources contain a wealth of information, from the native names of plants, their use, function, or assumed properties, *some* of their morphological features, or appearance, and again, their number (from roughly 350 to about 1300, as far as we know). When one attempts to *make sense* of this type of information, however, one meets major obstacles.

I will come back to this point below, but first I will introduce a second set of data we have at disposal, that is archaeological remains. Ever since the first archaeological excavations began to explore the ancient sites of the region in the mid-1800s, residues of ancient plants, seeds, fibers, and even impressions on clay, have emerged from the soil. These past few decades have seen an increasingly more accurate and extensive effort to collect, analyze and systematize paleo-botanical residues, divided by geographical areas and time periods, in the hope to create a repertoire of plant species.[6] These repertoires are important because of

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[2] For an edition of this text, see Henry Stadhouders, "The pharmacopoeial handbook *Šammu šikinšu* – An edition", *Le Journal des Médecines Cunéiformes* 18 (2011): 3–51, and "The pharmacopoeial handbook *Šammu šikinšu* – A translation", *Le Journal des Médecines Cunéiformes* 19 (2012): 1–21. Also cf. Maddalena Rumor, "At the Dawn of Plant Taxonomy: Shared Structural Design of Herbal Descriptions in *Šammu šikinšu* and Theophrastus' *Historia plantarum* IX", in *Magic and Medicine in Mesopotamia: Studies in Honor of Markham J. Geller*, ed. Strahil V. Panayotov and Luděk Vacín (Leiden/Boston: Brill, 2018), 446–461 on the relationship between this work and other works in history considered "herbals".

[3] Cf. Böck, "Sourcing, Organizing", 690.

[4] For the first edition of these texts, see Erich Ebeling, "Mittleassyrische Rezepte zur Herstellung von wohlreichenden Salben", *Orientalia* 17 (1948): 129–145 and 299–313. For a more recent translation, also see: Eduardo A. Escobar, "Tappūtī-Bēlat-Ekalle: A Cuneiform Tablet on Middle Assyrian Perfumery (C. 1200 BCE)" in *Women in the History of Science: A Sourcebook*, ed. Hannah Wills, et al. (London: UCL Press, 2023), 15–22.

[5] The gastronomic recipes have been studied in detail by Jean Bottéro, who discussed them in several publications, particularly in his *Textes culinaires Mésopotamiens*, vol. "Mesopotamian Civilizations" (University Park, PA: Eisenbrauns, 1995). For an introduction to the topic, also see Jean Bottéro, *The Oldest Cuisine in the World: Cooking in Mesopotamia* (Chicago: The University of Chicago Press, 2004).

[6] See Luca Peyronel, Agnese Vacca and Claudia Wachter-Sarkady, "Food and Drink preparation at Ebla, Syria. New data from the Royal Palace G (c. 2400–2300 BC)", *Food & History* 12 (2014): 36–38. For a list of plants present in Mesopotamian archaeological sites also cf. Anne-Isabelle Langlois, "Quelque plantes présentes en Mésopotamie", *Le Journal des Médecines Cunéiformes* 18 (2011): 52–76.

the data they can offer, such as the identification of species present in a specific area, or at a specific point in time, but they can be used productively to assist textual research as well. A list of botanical remains that were found in archaeological excavations from Syria and Iraq (and were originally published in many scattered archaeological reports) has recently been prepared by Isabelle Langlois (2011). An example of how such a list can be employed will be given below. Yet, paleo-botanical residues offer no indication of their ancient names, with the result that nearly any single one of them could have been known in antiquity by any of the names we read in the texts.

A correlation of the two sets of data, archaeological and textual, would be an invaluable tool, as it would allow us to connect plant species with their ancient names. Unfortunately scholarship is still a long way from being able to do so, and this is the crucial problem affecting all disciplines studying Mesopotamian plants, directly or indirectly.

Of the few names of plants that have so far been identified reliably, most are cultivated food crops.[7] Because of their frequent and continuous use, such names often survive as cognates, although this is not the only reason why they are more easily identified; their interpretation is also facilitated by the textual context in which they occur (generally in gastronomical recipes, or administrative records). The great majority of all other names, that is those of plants that were *not* used as foodstuff or spices, is still for the most part inscrutable, as exemplified by the following medical text where unidentified plant names are left in the original language, and names of uncertain identification are marked with a (?) in superscript: "If a man has been seized by *ra'šānu* (and) his head, his face, his lips are swollen, to cure him pulverize *kukuru*, juniper$^{(?)}$, *atā'išu*, [...], *kammantu*, roast *saḫlû*, roast *kasû*, flour of parched corn, *nikiptu*; these 9 ingredients, together, knead in *kasû*-water, shave the head, anoint thoroughly with old butter, bandage onto him, and he will recover" (*BAM* 3 i 26).

Since so many of these plant names lack a translation, it is difficult to assess the exact purpose of most medical remedies, left alone their effectiveness; the criteria followed by plant lists are likewise obscure; descriptions of royal gardens also cannot be properly appreciated; our interpretation of herbals remains limited; technical recipes for the creation of perfumes are most arduous to re-create, and so on and so forth: every analysis of cuneiform texts mentioning plants, trees, bushes, and aromatic substances, is bound to stumble on the same obstacle, which is unlikely to be overcome by focusing exclusively on Mesopotamian culture, or exclusively through philological methods.

A third set of data should also be mentioned. In the late 19th century several botanical

[7] See, for instance, the various contributions published in the *Bulletin on Sumerian Agriculture* (*BullSA*) in 1985 (on legumes and oil-seed crops) and 1987 (some common vegetable and fruit terms). Further discussion on these terms often continued through the years, as, for example, in the case of sesame. See Hervé Reculeau, "Le point sur la 'plant à huile' : réflexions sur la culture du sésame en Syrie-Mésopotamie à l'âge du Bronze", *Journal des Médecines Cunéiformes* 13 (2009): 13–27.

publications appeared in Europe on the flora of the Near East.[8] Their publication prompted further interest in the traditional *medical* use of those plants, to the point that in the 1930s, a number of anthropological expeditions, such as the ones of Dr. Cowan and Dr. Darlington in 1929, of Captain Johnston-Saint in 1933 and of Henry Field in 1937,[9] were organized with the intent to study and preserve the folk medical knowledge of the region. These expeditions not only collected specimens of native plants from the bazaars, the gardens and fields of Syria, Iraq, Iran and surrounding areas, but also recorded their vernacular names, and especially traditional knowledge regarding their properties, and use. In so doing, they attempted to connect all three areas needed for a better understanding of the Babylonian material, that is a) nomenclature, b) use, and c) identified plant species (with their scientific, Linnaean name), and yet the information they collected cannot solve the problems described above in one simple step, mainly due to the fact that such expeditions were carried out two millennia after the demise of Babylonian language and civilization. As much as traditional knowledge can endure the centuries (and millennia sometimes), during those two millennia the region went through extensive influence from non-local medical systems – the Greek one in particular – and thus, when reconstructing pre-Greek information about ancient Mesopotamian plants, these studies should be used with caution.

4. (Short) history of the discipline and main problems

Well aware of all this, early Assyriologists realized that making sense of the native botanical nomenclature was essential: without first understanding what those hundreds of names meant, very little could be done to shed light onto important aspects about the ancient traditional society they were studying, such as a) the rationale with which plants were used, prescribed, organized, classified, valued – in any domain; b) the reconstruction of their provenance, and possibility of trade; c) the question of interrelations and interconnections of Babylonian knowledge in its historical and cultural contexts.[10]

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[8] See, for example: Johann L. Schlimmer, *Terminologie Médico-Pharmaceutique et Anthropologique Française-Persane* (Theheran: Lithographie d'Ali Gouli Khan, 1874); James E.T. Aitchison, *Notes on the Products of Western Afghanistan and of North-Eastern Persia*, Edinburg: Neill & Co, 1890); Rev G.E. Post, *Flora of Syria, Palestine and Sinai* (Beirut, Syria: Syrian Protestant College, 1896); Bernard Gilliat-Smith and William Bertram Turril, "On the Flora of the Nearer East: a Contribution to Our Knowledge of the Flora of Azerbaidjan, North Persia", *Bulletin of Miscellaneous Information (Royal Botanic Gardens, Kew)* 7 (1930): 273–312.

[9] David Hooper and Henry Field, *Useful Plants and Drugs of Iran and Iraq*, vol. 9/3 (Chicago: Field Museum of Natural History, 1937).

[10] For example, any sharing of knowledge and practices with other surrounding peoples, such as the Egyptians, the Greeks and the Romans. I have worked for some time on this specific question, focusing on the comparative analysis of combination of ingredients, but I found myself having to restrict my investigation to animal-based ingredients and *Dreckapotheke* (filthy medicaments), for the simple reason that those names do have a (literal) translation, and thus their attestations can be compared; but again, there are many other related questions that

About a century ago, numerous identifications were proposed by Reginald Campbell Thompson, in his *Assyrian Herbal* (1924),[11] in the *Dictionary of Assyrian Botany*, published 25 years later (1949), and in his many translations of cuneiform medical texts. At a very early stage in Assyriology, Thompson put together a wealth of information, benefiting from his knowledge of Semitic languages, as well as of plant-use in folk medicine from northern Iraq where he had excavated for several years. His work was pioneer, yet very erudite for the time, and it had the merit to bring further interest to the matter. A number of his identifications, however, depended on dubious etymologies, which were then taken for granted, without further enquiry, for several decades.

One example will suffice to render the idea: one of the most common names of plants in the Babylonian medical corpus is *lišān kalbi*, literally "dog's tongue". On the basis of the expression's literal meaning (which probably reflects the appearance of the leaves of the plant), and especially based on the apparent cognate in Arabic *lisān al-kalb*, which can represent both *Cynoglossum* and *Plantago* (plantain), Thompson concluded that *lišān kalbi* probably referred to *Cynoglossum*, also meaning (in Greek) "dog's tongue".[12] The suggestion presented two problems: first, *cynoglossum officinale* is *not* native of Mesopotamia, *nor* – according to Isabelle Langlois' list (2011) – is it present among the botanical remains found in archaeological excavations from Syria and Iraq. And yet, *lišān kalbi* is all-present in the medical texts, which seems to indicate that it was a very common medicinal plant in Mesopotamia. The second problem is that even though the Arabic language can be used to better understand Akkadian, Arabic *pharmacology*, because of its history, includes numerous calques from Greek. It is therefore plausible that Arabic *lisān al-kalb* may derive from Greek, especially when we keep in mind that Greek κυνόγλωσσον was a native plant in Greece. Additional examples could be produced from the *Dictionary of Assyrian Botany* that are just as problematic.

Not all, however, is as bleak as it appears from the picture sketched above. A small number of early identifications – proposed not only by Thompson, but also by other scholars – seem convincing and have become widely accepted. For instance, the identification of *bīnu* as tamarisk, mostly based on the etymology of Aramaic and Syriac *bīnā*-tamarisk,[13] is fairly

would be interesting and important to ask, and yet their answers are contingent on the identification of plant names.

[11] Reginald Campbell Thompson, *The Assyrian Herbal* (London: Luzac and co., 1924).

[12] Reginald Campbell Thompson, *A Dictionary of Assyrian Botany* (London: The British Academy, 1949), 23–27.

[13] Heinrich Zimmern, *Akkadische Fremdwörter als Beweis für babylonischen Kultureinfluß* (Leipzig: publisher, 1915), 53; Michael P. Streck, "Dattelpalme und Tamariske in Mesopotamien nach dem akkadischen Streitgespräch", *Zeitschrift für Assyriologie* 94 (2004): 251–252. According to Igor Mikhailovich Diakonoff, "Die Arier im Vorderen Orient: Ende eines Mythos", *Orientalia Nova Serie* 41 (1972): 100 n. 41, *bīnu* could have entered Akkadian as a loan-word from Hurrian *paine* (apud Strahil V. Panayotov, "Magico-medical Plants and Incantations on Assyrian House Amulets", in *Sources of Evil: Studies in Mesopotamian Exorcistic Lore*, ed. Greta Van Buylaere et al. (Leiden/Boston: Brill, 2018), 207.

established, even though it is still unclear which species of tamarisk the name refers to, as many are the varieties of tamarisk present in Iraq. Even when a general understanding of the terminology is reached, it often lacks precision.

Despite these early and appreciable attempts, botanical knowledge about Mesopotamian plants progressed slowly over the decades. Starting in the 1950s, Assyriologists focused on editing the lists of plants, identifying, reconstructing, copying and joining hundreds of fragments scattered across many different museums (before even publishing any work on their transliteration and translation). Several scholars, from James Kinnier Wilson in the 1950s, to Franz Köcher between the 1950s and 1990s,[14] to recent[15] and future projects aiming at issuing the full edition of plant lists,[16] have spent countless hours in trying to reconstruct a reliable picture of the original texts, an effort that will hopefully soon bring some light to the matter.

5. Approaching the study of Mesopotamian plants: Some examples

At present, different methods have been adopted in order to begin addressing the difficulties involved in the study of plants in Mesopotamia. Some of these methods will be illustrated below separately, even though they generally tend to be used in combination.

When one first attempts to identify Babylonian botanical terminology, the initial approach is naturally comparative. Just as Thompson did, one first explores whether loan-words in the names of plants can be recognized in other similar idioms, in Semitic or non-Semitic languages. As shown earlier, loanwords are not always unquestionable, or their transmission as simple as it may appear, yet their study is interesting and necessary, and especially their

[14] Franz Köcher, *Keilschrifttexte zur assyrisch-babylonischen Drogen und Pflanzenkunde* (Berlin: Akademie-Verlag, 1955); Id., *Ein text medizinischen Inhalts aus dem neubabylonischen Grab*, vol. 10, in *Uruk: Die Gräber. Ausgrabungen in Uruk-Warka*, ed. Rainer M. Boehmer, Friedhelm Pedde and Beate Salje (Mainz am Rhein: Philipp von Zabern in Herder, 1995), 203–217.

[15] Annie Attia-Buisson and Gilles Buisson, "*BAM* 1 et consorts en transcription", *Le Journal des Médecines Cunéiformes* 19 (2012), 22–51; Henry Stadhouders, "The Pharmacopoeial Handbook Šammu šikinšu: An Edition", *Le Journal des Médecines Cunéiformes* 18 (2011): 3–51; Id., "The Pharmacopoeial Handbook Šammu šikinšu: A Translation", *Le Journal des Médicines Cunéiformes* 19 (2012): 1–21; Jan Tavernier, "KADP 36: Inventory, Plant List, or Lexical Exercise", in *Proceedings of the 51st Rencontre Assyriologique Internationale*, ed. Robert D. Biggs, Jennie Myers and Martha T. Roth (Chicago: The Oriental Institute, 2008), 191–202; Franziska Desch, *Die mittelassyrische 'Dreckapotheke': Ihr Gebrauch in der Pflanzenliste KADP 1* (Master diss., Freie Universität Berlin, 2013); Barbara Böck, Shahina A. Ghazanfar S.A. and Mark Nesbitt, *An Ancient Mesopotamian Herbal* (Kew: Royal Botanic Gardens, 2024).

[16] A recent ERC project ("Floriental. From Babylon to Baghdad: Toward a History of the Herbal", 2011–2017) has supported work on the edition of the pharmaceutical lists URU.AN.NA and MÚD-UR.MAḪ, of which the manuscript copies are now available (Jeanette C. Fincke, *An Ancient Mesopotamian Herbal Handbook: The Series uru.an.na and mú-ur.maḫ*, vol. 1: *The Tablets* (Leuven/Paris/Bristol: Peeters, 2021). The entire edition will be published by Jo-Ann Scurlock.

identification is important when other common elements are also present, such as the physical descriptions of a plant, the procedures with which it was handled, or applied, or the qualities it was known for (its medicinal properties, its usefulness in the production of glass, or else), ultimately confirming the identification. Even though the details might be partial or fragmentary, some level of information about all three categories is generally available. Morphological descriptions of plants, for example, can sometimes be derived from the Mesopotamian Herbal *Šammu šikinšu*, but they may also be found scattered in random passages. The procedures with which plants were handled, or administered, abound in the technical literature, and even though the instructions preserved in such procedural texts are often too generic to be of much help (e.g. to "pound" a substance hardly suggests any information as to the specific nature of what may be pounded), they occasionally do provide specific clues that allow at least the *exclusion* of some options. And finally, it is also possible to determine what qualities or properties a plant was known for from the purposes it was used for, and from the technical context in which it was mentioned (medical, gastronomical, perfume, glassmaking, dying procedures).

Anti-witchcraft recipes, for instance, often used a recurring combination of the same four to five ingredients *tarmuš*, *maštakal*, *sikillu*, *imḫur līm*, *imḫur ešrā*, which were specifically known to be effective against that affliction. At least one of them (*maštakal*) appears to have been a type of soapwort (*Saponaria officinalis*) – although one must keep in mind that this specific identification is not certain, and has been challenged.[17] Another plant in the set (*sikillu*) seems to have had purging properties and was called "pure" (or "purifying"). Once we recognize that, in the context, these plants were employed for the purposes of cleansing, or expelling "pollution," we can then expect the other ones in the group, the ones that have *not* been identified, to also share similar properties.

Indirectly, also medical recipes carry important clues about the special qualities of their ingredients, since they regularly describe the symptoms they are meant to treat. Their tendency, however, to occur as compound medicaments (i.e. listing several different symptoms and several different plant-ingredients) makes it extremely difficult to discern what substance was actually doing what.

A less intuitive method, and less commonly employed because of the rarity of the evidence,

[17] *Mrkt* in Gittin 69b refers to *martakal*, one of the spellings of *maštakal*. See Markham J. Geller, "An Akkadian Vademecum in the Babylonian Talmud", in *From Athens to Jerusalem: Medicine in Hellenized Jewish Lore and in Early Christian Literature*, ed. Samuel Kottek et al. (Rotterdam: Erasmus Publishing, 2000), 28; Id., *Akkadian Healing Therapies in the Babylonian Talmud* (Berlin: Max-Planck-Institut für Wissenschaftsgeschichte, 2004), 24 (*apud* Panayotov, "Magico-medical Plants", 208–209). According to Thompson (*Dictionary of Assyrian Botany*, 39), *maštakal* was a "washing" plant, a soapwort, such as those widely used among the rural population of Iraq. However, other *Salsola* species are also available in the region, again used as washing plants, and some of these *Salsola*-plants may have been associated with yet another name, the *uḫūlu-qarnānu*-plant. See Cinzia Pappi, *Seifen(kraut)*, vol. 12, in *Reallexikon der Assyriologie*, ed. Michael P. Streck (Berlin: De Gruyter, 2010), 353.

is to pair textual mentions or descriptions of plants with their physical attestations, such as, for example, their material impression on clay. This particular method has been used in a study that analyzed house amulets.[18] In Mesopotamia, house amulets often took the shape of clay tablets containing spells or incantations that were aimed at protecting the house from various evils, and they were hung in the house. In some cases, the sides of these amulets presented holes and slots where organic materials, specifically plant *leaves* and *branches*, seem to have been inserted, leaving traces of fibers on the wet clay. Today the organic material has decomposed, but its traces are still visible. Some of the incantations on these amulets mentioned plants, by themselves or in combination, whose magico-medical powers were meant to be activated, as in the following example: "Incantation: 'I have stepped on you, I am bringing you in, O ta[marisk] (*bīnu*), pure tree, soapwort (*maštakal*), and 'offshoot'[19] of the da[te-palm] (*libbi gišimmari*) [...]. I have looked at the tamarisk (*bīnu*) – may it (the evil) be undone for me. I have looked at the [soa]pwort (*maštakal*) – may it be annulled [for me]. I have looked at [the "offshoot" of the] da[te palm] (*libbi gišimmari*) [...]'" (KAT 78).[20]

All three plants mentioned (tamarisk, soapwort, and date palm) have been considered as candidates for the slots and holes present in the clay, and at least in the case of the *libbi gišimmari*, it appears that the marks left in the clay may correspond to the traces that a leaf of *Phoenix dactylifera* (otherwise: date-palm) could have left behind, confirming the identification.[21]

The identification of plant names is essential for the study of ancient plants, but larger questions, aimed at exploring how *knowledge* of the same was obtained, how it was maintained, transmitted, and elaborated are likewise important. Babylonian sources are invariably silent in this regard, but occasional pointers hide *behind* what contemporaries were saying, or *beneath* intercultural misunderstandings, which only emerge from comparative explorations. A recent case study explored comparable methods used to describe botanical information in the Mesopotamian Herbal *Šammu šikinšu* and in Book 9 of Theophrastus' *Historia Plantarum,* concluding that knowledge and methods in the study of plants were most likely shared between the two cultures.[22] This investigation is just one example of how comparative work can lead to new insights in the matter, and is important not only for its implications in the transmission of methods in the first millennium BCE, but also because it ultimately suggested we can still learn something new from Theophrastus. Any additional element that may

[18] Panayotov, "Magico-medical Plants".

[19] According to Landsberger (Benno Landsberger, "The Date Palm and is By-products According to the Cuneiform Sources", *Archiv für Orientforschung* 17 (1967): 14a, e), the logogram ŠÀ for *libbu* may have replaced an older writing PEŠ for *libbu*, offshoot, frond, branch (*apud* Panayotov, "Magico-medical Plants", 205).

[20] Cf. Panayotov, "Magico-medical Plants", 204.

[21] Ibid., 205–206.

[22] Rumor, "At the Down of Plant Taxonomy".

contribute in any way to the research on Mesopotamian plants has the potential to be, given the present situation, extraordinarily useful.

A second case study can be mentioned to show the potentials of such an approach. In the context of a cross-cultural investigation of astro-medical texts,[23] the study discusses Galen's (2nd c. CE) comments in regard to some of the 36 so-called "sacred plants of the Horoscopes". According to Galen, those plants were recorded in a book attributed to Hermes the Egyptian but ought to be dismissed as nonsense. What turns out instead is that such names were simply symbolic, and their real nature can now be explained and reconstructed thanks to cuneiform sources. Here is Galen:

> He [Pamphilus] then goes on to mention *a plant named 'eagle'* [Gr. *aetos*], as he claims, about which he concedes that no Greek has ever said anything; instead, it [= the eagle-plant] is recorded in one of the books attributed to *Hermes the Egyptian*, containing the *36 sacred plants of the horoscopes*, all of which are clearly nonsense very similar to the *ophionika* and the *conkhakokhla*. But there never was such a thing as a *conkhakokhlos*; its very name is ridiculous, just like the rest of the material in his book. Besides, the 36 plants exist merely in name and are not based on any real plant.[24]

The "eagle plant" mentioned by Galen as one of the "36 sacred plants of the horoscopes" happens to occur on cuneiform astro-medical tablets with the same cover name $TI_8^{mušen}$/Akk. *erû*-eagle. In those tablets it is likewise used in correspondence with *Aquarius*, one of the constellations of the Zodiac ("the horoscopes"): "Eagle($TI_8^{mušen}$/*erû*)-head, wing and blood (plants of Aquarius)" (*SpTU* 3, 104).

The cuneiform text from which the line above is quoted has been identified as having a textual parallel in a passage by Pliny the Elder,[25] who suggests a correspondence between "eagle" ingredients and "boxwood," a real plant, which (Pliny explains) is supposed to be employed for fever when the sun or the moon are crossing the constellation Aquarius:

> [...] It is especially in fevers that true medicine is opposed to the doctrines of the quacks. In fact they (the *magi*) have subdivided it (the treatment) in 12 signs (of the zodiac), according to the passage of the sun and again of the moon; [...] If (either sun or moon) is passing through Virgo, grains of barley (must be used); [...] if through Aquarius, boxwood charcoal (*buxo carbonibus*), pounded. [...].[26]

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[23] Maddalena Rumor, "Babylonian Astro-medicine, Quadruplicities and Pliny the Elder", *Zeitschrift für Assyriologie* 111, no. 1 (2021): 55–57.

[24] Gal., *SMF* VI, *proem.* (= XI, 797–798 K.). Translation by Caroline Petit, "Galen, Pharmacology and the Boundaries of Medicine: a Reassessment", in *Collecting recipes. Byzantine and Jewish pharmacology in dialogue*, ed. Lennart Lehmhaus and Matteo Martelli (Berlin: De Gruyter, 2017), 53–54.

[25] Plin., *HN* XXX, 29. See Rumor "Babylonian Astro-medicine".

[26] Plin., *HN* XXX, 95–97: "[...] *praecipueque febrium medicina placitis eorum renuntiat. Namque et in duodecim signa digessere eam sole transmeante iterumque luna,* [...] *si virginem alteruter, hordei granis;* [...] *si aquarium, e buxo carbonibus tritis*". Translation adapted from William H. S. Jones, *Pliny, Natural History*, vol. 8 (Cambridge,

What is particularly revealing about this last example is the identification of specific elements that were coded in the original source (in the cuneiform tablet, or in Hermes the Egyptian) and that instead occur *with their explanation*, that is with the name of a plant, in the new rendering (in Pliny). Creating a precedent, the example opens up the possibility that additional, similar, cases may be found in other instances of mistranslation or misunderstanding.

6. Conclusions

Ultimately, because of all the problems discussed above, any potential piece of evidence, manifesting itself in any possible way, from any source, or even by accident, is priceless. The examples I chose to present in this short overview were the result of individual scholars' creativity, luck, and human focus on limited data. But no single individual, no individual scholar can process the amount and variety of evidence available, and correlate the figures in comprehensive ways. To assist human intuition, it would be most advantageous that all findings and textual data concerning plants in Mesopotamia be worked into a system allowing comparison, proportional analysis of occurrences, quantitative and qualitative appreciation, cross-querying,[27] and whenever appropriate even verify the data with experimentation. A further understanding of the subject, in my opinion, would finally be the result of a holistic and interdisciplinary examination that correlates Babylonian sets of plants and all their uses, with repertories of the same type of knowledge as derived from archaeology, paleo-botany, anthropology, and again from the cross-investigation of all extant texts produced by roughly-contemporary ancient civilizations, such as the Egyptian, Greek, Roman, Syriac, and perhaps even Medieval – a colossal, yet exciting, enterprise for the future.

MA: The Loeb Classical Library, 1963), 338–341. Another astro-medical text from Achaemenid Sippar prescribes the mineral *pappardilû*, mixed in 'eagle oil' (ì.GIŠ TI$_8^{mušen}$) to be anointed onto the patient's legs, again, in correspondence of Aquarius (BM 42385, edited in Irving Finkel, "On Late Babylonian Medical Training", in *Wisdom, Gods and Literature: Studies in Assyriology in Honour of W.G. Lambert*, ed. Andrew George and Irving Finkel (Winona Lake: Eisenbrauns, 2000), 214 n. 55: 22). Furthermore, a certain phonetic resemblance may be noticed between the Mesopotamian terms for 'eagle' and 'boxwood.' Akk. *urinnu* is a term for a regal bird often symbolizing the Assyrian king (the term is loaned from Sum. u$_{11}$-ri-in, which indicates the 'eagle'), and is very similar to the name of at least two trees originating from the Lebanese mountains, which are often mentioned together, that is the *erēnu* (var. *erinnu*) cedar, a tree also associated with royalty, and *taskarinnu*, our boxwood tree. There is thus a reasonable likelihood that, based on Pliny, we can identify both the *Kalendertexte*'s eagle-ingredients in *SpTU* 3, 104 and 105, and Galen's '*aetos*-eagle plant' to be cover names for boxwood-related substances.

[27] For example, it would be useful to be able to cross-analyze frequent combinations of plants with the specific purposes they were employed for; working with large data might also enable us to better discern the action of active ingredients within their context, both when they were used alone and in compound recipes.